

In the Claims

Please cancel claims ~~17~~-39.

Please amend claims 1, 40, 42 and 43 as follows:


Please add claims 44-53 as follows:

1. (AMENDED) A sample dispensing system comprising:
a dispensing pin having a tip and a sample chamber formed in the tip for holding a predetermined volume of sample, a sample filling channel formed in the tip and in fluid communication with the sample chamber for loading a liquid sample into the sample chamber and a droplet ejection nozzle formed in the tip and in fluid communication with the sample chamber for ejecting a droplet of the liquid sample from the sample chamber; and
an actuator coupled to the sample chamber for forming the droplet upon activation of the actuator.
2. (ORIGINAL) The sample dispensing system of claim 1, wherein the tip has a diameter between about 0.5 millimeters and about 5 millimeters.
3. (ORIGINAL) The sample dispensing system of claim 2, wherein the tip has a diameter of about 1.0 millimeters.
4. (ORIGINAL) The sample dispensing system of claim 1, further comprising a holder for mounting the dispensing pin.
5. (ORIGINAL) The sample dispensing system of claim 4, further comprising a control circuit for activating the actuator.
6. (ORIGINAL) The sample dispensing system of claim 5, further comprising an electrical connector for electrically connecting the control circuit and the actuator.
7. (ORIGINAL) The sample dispensing system of claim 1, wherein the dispensing pin is formed from a silicon wafer using a microfabrication technique.

8. (ORIGINAL) The sample dispensing system of claim 1, wherein the filling channel is separate from the ejection nozzle.

9. (ORIGINAL) The sample dispensing system of claim 1, wherein the filling channel includes a filling nozzle for introducing a liquid sample to the filling channel.

10. (ORIGINAL) The sample dispensing system of claim 9, wherein the filling nozzle extends beyond the ejection nozzle, such that when the tip is dipped into a reservoir, the filling nozzle is immersed in a liquid supply without immersing the ejection nozzle.

 11. (ORIGINAL) The sample dispensing system of claim 1, wherein the droplet ejection nozzle has an ejection port, said ejection port having a diameter between about thirty and about fifty microns.

12. (ORIGINAL) The sample dispensing system of claim 1, wherein the actuator comprises a piezoelectric film affixed to a side wall of the sample chamber.

13. (ORIGINAL) The sample dispensing system of claim 1, wherein the actuator comprises an electromechanical assembly for effecting ejection of a droplet from the ejection nozzle.

14. (ORIGINAL) The sample dispensing system of claim 1, wherein the actuator comprises a magnetic assembly for effecting ejection of a droplet from the ejection nozzle.

15. (ORIGINAL) The sample dispensing system of claim 1, wherein the actuator comprises a thermoelectric assembly for effecting ejection of a droplet from the ejection nozzle.

16. (ORIGINAL) The sample dispensing system of claim 1, wherein the filling channel and the sample chamber have a combined volume of between about 1 nanoliter and about 10 nanoliters.

17-39. (CANCELED)

40. (AMENDED) A pin for use in a system for discharging droplets, comprising:
a tip;
a sample chamber formed in the tip for holding a predetermined volume of sample;
a sample filling channel formed in the tip and in fluid communication with the sample chamber for loading a liquid sample into the sample chamber; and
a droplet ejection nozzle formed in the tip and in fluid communication with the sample chamber for ejecting a droplet of the liquid sample from the sample chamber.

41. (ORIGINAL) The pin of claim 40, further comprising an actuator coupled to the sample chamber for forming the droplet upon activation of the actuator.

42. (AMENDED) A liquid sample dispensing system, comprising:
a holder;
an array of dispensing pins connected to the holder, each dispensing pin having a tip and a sample chamber formed in the tip for holding a predetermined volume of sample, a sample filling channel formed in the tip and in fluid communication with the sample chamber for loading a liquid sample into the sample chamber and a droplet ejection nozzle formed in the tip in fluid communication with the sample chamber for ejecting a droplet of the liquid sample from the sample chamber; and
an actuator coupled to the sample chamber of one or more of the dispensing pins for forming one or more droplets upon activation of the actuator.

43. (AMENDED) A microfabricated sample dispensing system comprising:
a dispensing pin microfabricated on a silicon wafer, said dispensing pin having a tip and a sample chamber formed in the tip for holding a predetermined volume of sample, a sample filling channel formed in the tip and in fluid communication with the sample chamber for loading a liquid sample into the sample chamber and a droplet ejection nozzle formed in the tip and in fluid communication with the sample chamber for ejecting a droplet of the liquid sample from the sample chamber; and

an actuator coupled to the sample chamber for forming the droplet upon activation of the actuator.

44. (NEW) The droplet dispensing system of claim 1, further comprising a second pin having a second tip spaced from the dispensing pin to form second filling channel between the second pin and the dispensing pin, wherein the second filling channel is in communication with the sample filling channel.

45. (NEW) The droplet dispensing system of claim 44, wherein the dispensing pin and the second pin are movable relative to each other, so as to vary the size of the second filling channel.

46. (NEW) The sample dispensing system of claim 44, wherein the second filling channel forms a filling nozzle for introducing a liquid sample to the second filling channel.

47. (NEW) The sample dispensing system of claim 46, wherein the filling nozzle extends beyond the ejection nozzle, such that when the second pin tip and the dispensing pin tip are dipped into a reservoir, the filling nozzle is immersed in a liquid supply without immersing the ejection nozzle of the dispensing tip.

48. (NEW) The sample dispensing system of claim 1, wherein the sample filling channel, the sample chamber and the droplet ejection nozzle form a substantially U-shaped fluid path through the tip.

49. (NEW) The sample dispensing system of claim 1, wherein the droplet ejection nozzle is tapered.

50. (NEW) A sample dispensing system, comprising:
a dispensing pin having a tip;
a substantially U-shaped fluid path formed in the tip of the dispensing pin for conveying a liquid sample; and

an actuator coupled to a portion of the fluid path for forming a droplet of the liquid sample upon activation of the actuator.

51. (NEW) The sample dispensing system of claim 50, wherein said fluid path comprises:
a sample chamber for holding a predetermined volume of sample,
a sample filling channel in fluid communication with the sample chamber for loading a liquid sample into the sample chamber; and
a droplet ejection port in fluid communication with the sample chamber for ejecting a droplet of the liquid sample from the sample chamber.

52. (NEW) The sample dispensing system of claim 51, wherein the droplet ejection port forms a nozzle.

53. (NEW) A sample dispensing system, comprising:
a holder; and
a dispensing pin having a first end coupled to the holder and a second end forming a tip, wherein the tip includes a sample chamber formed in the tip for holding a predetermined volume of sample, a sample filling channel in fluid communication with the sample chamber for loading a liquid sample into the sample chamber, and a droplet ejection nozzle in fluid communication with the sample chamber for ejecting a droplet of the liquid sample from the sample chamber.

In the Figures

Please file the enclosed set of formal drawings (Figures 1-5). The enclosed set of drawings replace the informal drawings (Figures 1-5) filed with the application and do not add any new matter.